



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

University of Alaska
Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *seventeen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS SEED OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

GLAUCOUS BLUEGRASS

'Tundra'

In Testimony Whereof, I have hereunto set
my hand and caused the seal of the Plant
Variety Protection Office to be affixed
at the City of Washington
this 26th day of July in
the year of our Lord one thousand nine
hundred and seventy-seven

Attest:

R. R. Rollin
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

W. B. Bay
Secretary of Agriculture



APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See Reverse.

1. VARIETY NAME OR TEMPORARY DESIGNATION TUNDRA	2. KIND NAME Greenland or <u>Glaucous</u> bluegrass	FOR OFFICIAL USE ONLY PV NUMBER 7700033	
3. GENUS AND SPECIES NAME POA GLAUCA	4. FAMILY NAME (Botanical) GRAMINEAE	FILING DATE 1-27-77	TIME 2:00 P.M.
6. NAME OF APPLICANT(S) UNIVERSITY OF ALASKA AGRICULTURAL EXPERIMENT STATION	5. DATE OF DETERMINATION June 1974 (SEE ADDENDUM)	FEE RECEIVED \$ 250.00	BALANCE DUE \$ _____
		\$ 250.00	\$ _____
		\$ 250.00	\$ _____
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) PUBLIC INSTITUTION	7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) BOX AE PALMER, AK. 99645	8. TELEPHONE AREA CODE AND NUMBER 907/745-3257	
		11. DATE OF INCORPORATION	
10. STATE OF INCORPORATION			

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

Dr. Wm. W. Mitchell
Agricultural Experiment Station
Box AE
Palmer, Alaska 99645

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- ☒ 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- ☒ 13B. Exhibit B, Botanical Description of the Variety
- ☒ 13C. Exhibit C, Objective Description of the Variety
- ☒ 13D. Exhibit D, Data Indicative of Novelty
- ☒ 13E. Exhibit E, Statement of the Basis of Applicant's Ownership

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed? (See Section 83(a). (If "Yes," answer 14B and 14C below.) ☒ YES ☐ NO14B. Does the applicant(s) specify that this variety be limited as to number of generations? ☒ YES ☐ NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed?

☒ FOUNDATION ☒ REGISTERED ☒ CERTIFIED

The applicant declares that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) of this sexually-reproduced novel plant variety believes that the variety is distinct, uniform, and stable as required in Section 41 and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant is informed that false representation herein can jeopardize protection and result in penalties.

17 January, 1977
(DATE)Wm. W. Mitchell *Part of Agricultural Experiment Station*
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT) 00001

7700033

ADDENDUM TO APPLICATION

Chronology of Events:

With regard to item 5 on the application (Form GR-470), June 1974 must be considered a tentative date of determination. At that time preliminary judgments had been made on the arctic trials of bulk, unselected seed lots from increases of IAS 231 (see Exhibit A). Confirmation still had to be obtained, however, on the performance of material from IAS 305, the selections made in 1973 that eventually formed the basis for the variety. Also, performance data had to be obtained on seed production. I decided, therefore, to increase seed of IAS 305 and established what constituted a foundation seed planting in June 1974. A small amount of seed was obtained in 1974 from this planting, a good amount was harvested in 1975, and a negligible amount in 1976. Another foundation seed planting was established in 1975 and an excellent harvest was obtained in 1976. Results of the Prudhoe Bay trials with the selected material, IAS 305, were consistent with the previous results. Thus with the arctic trials showing strong growth in early 1976, their third season of growth, and seed production stands at Palmer providing adequate yields for 1-2 years, at least, it was decided in June 1976 to release the variety for commercial production. Foundation seed lots were provided two growers in June and July for 1976 plantings. Neither grower harvested any seed in 1976, however. In a further trial of seed production methods we planted nearly an acre of foundation seed in 1976 and harvested about 100 lbs of certifiable seed. The Notice of Release of 'Tundra' is enclosed.

00002

EXHIBIT A

Origin and Breeding History of the Variety:

1. Tundra bluegrass originated from seed collections made in 1969 and 1970 from native plants of Poa glauca in the vicinity of an oil exploration staging area called Sagwon along the Sagavanirktok River in arctic Alaska. The seed lots from these collections were designated IAS 231. 'Tundra' resulted from selections of individual plants out of a spaced planting of IAS 231.
2. About 500 individual plants were established in a spaced-plant nursery at Palmer, Alaska, in 1971. Growth habits manifest in the nursery ranged from extremely prostrate types to a semi erect type. The plants also varied in their tolerance to the relatively southern, boreal conditions at Palmer (for plants of arctic origin). Fortunately the most erect type also was the most durable. Eighty-four of these plants very similar in form, were selected in 1973. Seed from the 84 selections comprised the original breeder seed of the variety and was used for production of foundation class seed. This material was designated IAS 305. In 1975 the number of selections for the breeder's stock was reduced to 23 plants that are being propagated vegetatively. Because of the difficulty of maintaining this arctic material under boreal conditions, however, small lots of seed from the individual breeder plants are being maintained to reconstitute lost plants if necessary.
3. Progeny are very similar to each other and to the parents, indicating a high degree of selfing or possibly apomixis. The particular mode of reproduction has not been determined as yet.
4. The few generations observed to date indicate a high degree of stability. However, seed production stands at the Palmer latitude become seriously depleted after their second or third year because of disease or poor adaptability. Nevertheless, fair to excellent seed production is possible for 2 years.

00003

Arctic, restricting it to the Aleutian Islands and southern coast of Alaska. The variety agrees sufficiently well with the descriptions of P. glauca in Hulten, Polunin (Polunin, N. 1959. Circumpolar arctic flora. Oxford at the Clarendon Press), and Welsh (Welsh, S.L. 1974. Anderson's flora of Alaska. Brigham Young University Press).

00004

OBJECTIVE DESCRIPTION OF VARIETY
BLUEGRASS (POA SPP.)

NAME OF APPLICANT(S)

UNIVERSITY OF ALASKA AGRICULTURAL EXPERIMENT STATION

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

BOX AE

PALMER, AK. 99645

FOR OFFICIAL USE ONLY

PVPO NUMBER

7700033

VARIETY NAME OR TEMPORARY
DESIGNATION

TUNDRA

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. or) when number is either 99 or less or 9 or less.

1. KIND:

 1 = POA COMPRESSA 2 = P. PRATENSIS 3 = P. TRIVIALIS 4 = OTHER (Specify) P. GLAUCA

2. REGION OF BEST ADAPTATION:

 1 = NORTHEAST 2 = TRANSITIONAL ZONE 3 = NORTH CENTRAL 4 = PACIFIC N.W. 5 = OTHER (Specify) ARCTIC

3. MATURITY (At First Anthesis):

 1 = EARLY (Delta) 2 = MEDIUM EARLY (Fylking) 3 = MEDIUM (Newport) 4 = LATE (Merion)
mid to late June

<input type="text"/>	<input type="text"/>	NUMBER OF DAYS EARLIER THAN	<input type="text"/>	}	1 = NUGGET	2 = FYLKING
<input type="text"/>	<input type="text"/>	NUMBER OF DAYS LATER THAN	<input type="text"/>		3 = DELTA	4 = MERION
					5 = NEWPORT	6 = BARON

4. PLANT HEIGHT (Longest Shoot from Soil Surface to Top of Head):

 CM. HEIGHT

<input type="text"/>	<input type="text"/>	CM. SHORTER THAN	<input type="text"/>	}	1 = NUGGET	2 = FYLKING
<input type="text"/>	<input type="text"/>	CM. TALLER THAN	<input type="text"/>		3 = DELTA	4 = MERION
					5 = NEWPORT	6 = BARON

5. HABIT:

 1 = PROSTRATE (Fylking) 2 = SEMI-PROSTRATE (Merion)
3 = ERECT (Delta)

6. VEGETATIVE REPRODUCTION (1 = Absent; 2 = Present):

 RHIZOMES STOLONS

7. LEAF BLADE:

 Color: 1 = LIGHT GREEN (Rough Bluegrass) 2 = BLUE GREEN (Canada Bluegrass) 3 = MODERATELY DARK GREEN (Merion)
4 = DARK GREEN (Adelphi) 5 = OTHER (Specify) Upper Surface: 1 = SHINY 2 = DULL Lower Surface: 1 = SHINY 2 = DULL MM. WIDTH MM. LENGTH

8. LEAF SHEATH (Base):

Upper: 140 mm

 Seedling Color: 1 = GREEN 2 = RED MM. LENGTH Keel: 1 = NOT KEELED 2 = KEELED

Surface:

 1 = GLABROUS 2 = PUBESCENT 1 = SMOOTH 2 = ROUGH 1 = NON-GLAUCOUS 2 = GLAUCOUS

9. LEAFINESS (At First Anthesis):

 Number of leaves per tiller or shoot: 1 = FEW (1 - 3) 2 = INTERMEDIATE (4 - 6) 3 = MANY (More than 6)

10. PANICLE:

 MM. LENGTH

<input type="text"/>	<input type="text"/>	MM. LONGER THAN	<input type="text"/>	}	1 = NUGGET	2 = FYLKING
<input type="text"/>	<input type="text"/>	MM. SHORTER THAN	<input type="text"/>		3 = DELTA	4 = MERION
					5 = NEWPORT	6 = BARON

00005

Data Indicative of Novelty:

To our knowledge 'Tundra' is the first cultivar named for the species Poa glauca.

'Tundra' has been developed for revegetation applications in arctic Alaska and possibly neighboring areas. In trials in the Prudhoe Bay area 'Tundra' was a superior performer in most situations tested. Other collections of P. glauca from Alaskan locations were also tested and found to be far inferior. They were insufficiently winter hardy and failed to maintain adequate coverage beyond 2 years. Other blue-grasses in the species P. pratensis were also tested and only 'Nugget' survived to any extent. It was marginal in hardiness, however. To our knowledge 'Tundra' is the first material of arctic origin to be made commercially available for use in the Arctic. There is an urgent demand for adapted materials in connection with oil and gas exploration, production, and distribution activities in this region of severe climatic conditions.



University of Alaska, Fairbanks

May 13, 1977

Agricultural Experiment Station
Palmer Research Center
Box AE
Palmer, Alaska 99645

Mr. Joseph J. Higgins
Examiner, Plant Variety Protection Office
USDA Agricultural Marketing Service
Grain and Seed Division
National Agricultural Library Building
Beltsville, Maryland 20705

Dear Mr. Higgins:

Regarding the small seed lots being maintained to reconstitute lost breeder plants of "Tundra," these seed lots include those of the original 84 plants. This is necessary because of the difficulty in maintaining the breeding stock by vegetative means through transplanting from year to year. In the event that seed of any of the breeder plants is lost or consumed, I want other sources of the same type to rely on. No separate designation was given to the 23 plants.

Superior performance in the arctic trials, the arctic origin of the material, and selection for manageable agronomic traits comprise the basis for constituting the variety. It can be distinguished morphologically from some but not all of the other members of the species. The species is highly variable. It was far superior in growth vigor and frost hardiness to other entries of Poa glauca included in the arctic trials. So in that regard, it is the best material available of the species for the purpose recommended. Apart from the infra-specific comparisons, it appears to be the best of anything currently available for arctic use, and therefore is extremely valuable to the arctic rehabilitation requirements.

We did not intend that the name of the applicant be withheld in the announcement of the application. You have our permission to publish the University of Alaska Agricultural Experiment Station as the applicant.

Sincerely,

Wm. W. Mitchell

Wm. W. Mitchell
Head Agronomist



km

00009

EXHIBIT E

7700033

Statement of Applicant's Ownership:

The University of Alaska Agricultural Experiment Station, Palmer, Alaska, believes it is the sole, original, and first breeder of 'Tundra', a variety of Poa glauca, for which it solicits a certificate of protection.

00008

May 5, 1987 letter to Brewer
Poa glauca?

Appendix 2.--Title V varieties (those listed under the certification option

Title V as of September 30, 1983)

<u>Alfalfa</u>	<u>Bluegrass, Rough</u>	<u>Foxtail, Creeping</u>
Baker	Po-Lis	Retain
Honeye		
Magnum	<u>Canarygrass, Reed</u>	<u>Oat</u>
Multileaf		
Oneida	Vantage	Allen
Riley		Benson
Saranac AR	<u>Clover, Red</u>	Brooks
Victoria		Coker 227
	Kenstar	Coker 716
<u>Barley</u>	Redland	Dal
Bold	Ruby	Firecracker
Georgie	Tristan	Four twenty two
Gus		Goodland
Kombar	<u>Clover, White</u>	7630
Lud		Big Mac
Maris Mink	Star	Mesquite
Menuet		Noble
Maravian 111	<u>Fescue, Chewings</u>	Southern States 76-30
Paoli		Stout
Pike	Banner	Wright
Reliance	Jade	
Summit	Jamestown	<u>Orchardgrass</u>
Wapana		Dolcea
Washonupana	<u>Fescue, Hard</u>	
<u>Bentgrass</u>	Silvana	<u>Rye</u>
Penneagle		Wheeler
<u>Bluegrass, Glaucantha</u>	<u>Fescue, Meadow</u>	<u>Ryegrass, Annual</u>
Tundra	Beaumont	Aubade
	<u>Fescue, Red</u>	Deltonic
<u>Bluegrass, Ky</u>		Deltop
Barbie	Fortress	Maris Ledger
Barblue	Menuet	
Enmundi	Merlin	<u>Ryegrass, Hybridium</u>
Harmony		Augusta
Mystic	<u>Fescue, Tall</u>	
Pacific		
Ram 1	Barcel	
Scenic	Kenhy	
Welcome	Missouri-96	

Understanding the Plant Variety Protection

Oregon State University Extension

Special Report 724
February 1985

5-5
Dr. Evans -
Should this
be checked
for accuracy?

Ann

"UNAUTHORIZED PROPAGATION PROHIBIT"
"TO BE SOLD BY VARIETY NAME ONLY
AS A CLASS OF CERTIFIED SEED—
U.S. PROTECTED VARIETY"

"UNAUTHORIZED PROPAGATION PROHIBITED"
"TO BE SOLD BY VARIETY NAME ONLY
AS A CLASS OF CERTIFIED SEED—
U.S. PROTECTED VARIETY"

"UNAUTHORIZED PROPAGATION PROHIBITED"
"TO BE SOLD BY VARIETY NAME ONLY
AS A CLASS OF CERTIFIED SEED—
U.S. PROTECTED VARIETY"

ly to apex. 21 —Moist woods, Jersey to Michigan and Illinois, to Florida and Texas.

Poa alpina L. ALPINE BLUEGRASS. (Fig. 159.) Culms erect from a rather thick vertical crown, rather short, 10 to 30 cm. tall; blades short, 5 mm. wide, the uppermost about middle of the culm; panicle ovoid short-pyramidal, rather compact, 8 cm. long, the lower branches reflexed; spikelets broad, purple purplish; glumes broad, abruptly reflexed; lemmas 3 to 4 mm. long, strongly villous on the keel and marginal nerves, pubescent on the intermediate nerves below, the intermediate nerves

22 —Mountain meadows, arctic regions of the Northern Hemisphere, extending south to Quebec, northern Michigan (Keweenaw Point), and the alpine summits of Colorado, Utah, Washington, and Oregon (Wallowa Mountains); Mex-

Poa stenantha Trin. (Fig. 160.) Plants tufted, 30 to 50 cm. tall;



FIGURE 160.—*Poa stenantha*. Panicle, $\times 1$; floret, $\times 10$. (Blankinship, Mont.)

ligule prominent, as much as 5 mm. long; blades flat or loosely involute rather lax, mostly basal, 1 to 2 mm. wide, the uppermost culm leaf below the middle of the culm; panicle nodding, 5 to 15 cm. long, the branches in twos or threes, arcuate-drooping naked below, with a few spikelets at the ends; spikelets 3- to 5-flowered, 6 to 8 mm. long; lemmas about 5 mm. long, pubescent on the lower part of keel and marginal nerves, sparsely pubescent on the internerves below.

23 —Moist open ground, Alaska, Alberta, and British Columbia, extending into Montana, Colorado (White River Forest), Idaho, Washington (Nooksack River), and Oregon (Crater Lake).



FIGURE 161.—A, *Poa glauca*. Panicle, $\times 1$; floret, $\times 10$. (Hitchcock 16053, N. H.) B, *P. glaucantha*. Panicle, $\times 1$; floret, $\times 10$. (Butters, Abbe, and Abbe 258, Minn.)

47. Poa glauca Vahl. (Fig. 161, A.) Plants glaucous, in close or loose tufts; culms compressed, stiff, 10 to 30 cm. tall, sometimes taller, naked above, the uppermost leaf usually much below the middle, its ligule

about 2 mm. long; blades mostly basal, 3 to 5 cm. long, 1 to 2 mm. wide; panicle 3 to 7 cm. long, narrow, sometimes rather compact, the branches erect or ascending, few-flowered; spikelets mostly 2- or 3-flowered, 5 to 6 mm. long; lemmas 3 to 4 mm. long, strongly pubescent on the lower half of the keel and marginal nerves and often slightly pubescent on the faint intermediate nerves.

24 —Rocky slopes, Arctic regions south to the alpine summits of New Hampshire; Wisconsin; Minnesota; Colorado. Common in Greenland; Eurasia.

48. Poa glaucantha Gaudin. (Fig. 161, B.) Plants mostly glaucous, culms compressed, in tufts, usually 30 to 70 cm. tall, leafy throughout; blades to 12 cm. long; panicle 6 to 16 cm. long, loose, but branches mostly ascending; spikelets 5 to 7 mm. long, 3- to 6-flowered; lemmas pubescent on keel and lateral nerves, sometimes with an obscure web at base. 25 —Mountain meadows, slopes, and cliffs, Newfoundland to Quebec, Minnesota, Montana, and Wyoming; Europe. Resembles both *Poa nemoralis* and *P. interior*, distinguished from both by the florets without web at base or with very obscure web, from *P. nemoralis* by the flat culms, and from *P. interior* by the more strongly keeled sheaths and larger spikelets. A variable and puzzling species, apparently intermediate between *P. nemoralis* and *P. glauca*. *Poa scopu-*

lorum Butters and ally slender lax for

49. Poa fernaldiana (Patt.) (Fig. 162.) Plants in culms weak and sometimes 30 cm. about 1 mm. basal, lax, mostly panicle narrow, 2 to 6 cm. ascending, naked, 4-flowered, about lemmas 3 to 3.5 mm. on the lower half marginal nerves, webbed at base, with *P. lara* H. species.) 26 —foundland and summits of Maine, Vermont, and New the upper cone ton.



FIGURE 163.—*Poa fernaldiana* (Patt.)



FIGURE 162.—*Poa fernaldiana*. Panicle, $\times 1$; floret, $\times 10$. (Fernald, Maine.)

50. Poa pat-
SON BLUEGRASS
loosely tufted
leaves, 10 to 2
ally folded, r
than 10 cm. l
panicle narrow

stres
 pubescent.
 nt and often rooting at base; keel of lemma
 23. *P. TRIVIALIS*.
 pressed or ascending..... 24. *P. MARCIDA*.
 er, naked below, spreading or drooping.
 nches mostly in fours or fives.
 25. *P. ALSODES*.
 ranches mostly in twos or threes.
 26. *P. LANGUIDA*.
 27. *P. SALTUENSIS*.
 nerves.
 metimes faintly so). Culms usually stout, 40
 d open, mostly more than 15 cm. long.
 28. *P. OCCIDENTALIS*.
 exed at maturity.
 n 15 cm. long, the branches several (usually
 30. *P. SYLVESTRIS*.
 m. long, the branches 1 to 3 together.
 31. *P. REFLEXA*.
 , 15 to 20 cm. long. Lemmas 4 mm. long,
 es; webbed at base; New Mexico.
 29. *P. TRACYI*.
 y nodding.
 stinct..... 32. *P. WOLFII*.
 obscure (distinct in *P. leptocoma*).
 rs, elongate, capillary, bearing a few spikelets
 lla joints short, hidden by the florets; sheaths
 ts; alpine rocky slopes.
 33. *P. PAUCISPICULA*.
 ints slender, somewhat elongate, usually not
 ths minutely roughened; culms solitary or in
 a distinct; uppermost ligule acute, 3 to 4 mm.
 below timber line..... 34. *P. LEPTOCOMA*.
 a obscure; uppermost ligule truncate, 0.3 to
 es region at low altitudes.
 35. *P. PALUDIGENA*.
 n more than 2, if only 2 not capillary and
 oullets with dark purple base; culms swollen
 36. *P. BULBOSA*.
 like at base.
 about as long as the first lemma; ligule very
 37. *P. NEMORALIS*.
 orter than the first lemma; ligules rather prom-
 leaves 1 to 3 mm. or more long.
 ; lemmas 4 mm. long.... 38. *P. MACROCLADA*.
 g; lemmas 2.5 to 3 mm. long.
 e purplish base; panicle 10 to 30 cm. long, large
 39. *P. PALUSTRIS*.
 a or tawny base; panicle mostly less than 10 cm.
 small and few-flowered..... 40. *P. INTERIO*.
 nalopae
 41. *P. CHAIXII*.
 lpinae
 ewed from the side of sheath.
 42. *P. FENDLERIANA*.

Ligule prominent, easily seen in side view, 5 to 7 mm. long..... 43. *P. LONGILIGULA*.
 Blades flat or, if involute, rather lax or soft.
 Panicle branches slender, spreading or drooping, the lower naked and simple for 3 to 4 cm.
 or more..... 44. *P. AUTUMNALIS*.
 Panicle branches not long and spreading.
 Panicle broadly pyramidal, condensed, about as broad as long, the lower branches
 spreading. Spikelets broad, subcordate..... 45. *P. ALPINA*.
 Panicle longer than broad.
 Panicle nodding, the lower branches slender, arcuate-drooping.
 46. *P. STENANTHA*.
 Panicle erect, the lower branches short (see also *P. gracillima*).
 Panicle rather loose, lower branches naked below, ascending (see also *P. macro-*
lada).
 Plants glaucous, culms flattened; panicle rather narrow.
 Spikelets 2- or 3-flowered; panicle 3 to 7 cm. long..... 47. *P. GLAUCA*.
 Spikelets 3- to 6-flowered; panicle 6 to 16 cm. long..... 48. *P. GLAUCANTHA*.
 Plants not glaucous; culms terete, rather lax..... 49. *P. FERNALDIANA*.
 Panicle narrow, condensed, the branches short (see also *P. unilateralis*).
 Culms rather lax; ligule minute; glumes about 4 mm. long.
 50. *P. PATTERSONI*.
 Culms stiff, ligule about 1.5 mm. long, glumes about 3 mm. long.
 51. *P. RUPICOLA*.

6. *Epiles*

Panicle open, 10 to 15 cm. long. Blades involute, slender..... 52. *P. INVOLUTA*.
 Panicle contracted or, if open, less than 10 cm. long.
 Blades scabrous, filiform, mostly basal.
 Spikelets 7 to 9 mm. long; lemmas 4.5 to 6 mm. long, mostly smooth.
 53. *P. CUSICKII*.
 Spikelets 6 to 7 mm. long; lemmas about 4 mm. long, scabrous..... 54. *P. NAPENSIS*.
 Blades glabrous.
 Lemmas minutely pubescent at base..... 55. *P. UNILATERALIS*.
 Lemmas glabrous.
 Blades of the culm 2 to 3 mm. wide, flat, those of the innovations slender and filiform.
 56. *P. EPILIS*.
 Blades of the culm and innovations similar. Panicle few-flowered.
 Panicle short, open, the capillary branches bearing 1 or 2 spikelets. Culms 10 to
 20 cm. tall..... 57. *P. VASEYCHLOA*.
 Panicle narrow.
 Lemmas 5 to 6 mm. long; panicle usually pale or silvery..... 58. *P. PRINGLEI*.
 Lemmas less than 4 mm. long; panicle usually purple.
 Glumes about as long as the first and second florets; panicle mostly not exceed-
 ing the short soft blades.
 Glumes and lemmas smooth, the lemmas erose at summit.
 59. *P. LETTERMANI*.
 Glumes and lemmas scabrous, the lemmas acute, scarcely erose.
 60. *P. MONTEVANSI*.
 Glumes shorter than the first floret; panicle usually much longer than the
 usually stiff blades..... 61. *P. LEIBERGII*.

7. *Scabrellae*

Sheaths somewhat scabrous..... 62. *P. SCABRELLA*.
 Sheaths glabrous.
 Panicle rather open, the lower branches naked at base, ascending or somewhat spreading;
 culms usually decumbent at base..... 63. *P. GRACILLIMA*.
 Panicle contracted, the branches appressed or at anthesis somewhat spreading.
 Culms slender, on the average less than 30 cm. tall; numerous short innovations at
 base. Blades usually folded..... 64. *P. SECUNDA*.
 Culms stouter, on the average more than 50 cm. tall; innovations usually not numerous.
 65. *P. CANBYI*.

8. *Nevadenses*

Sheaths scaberulous. Ligule long, decurrent..... 66. *P. NEVADENSIS*.
 Sheaths glabrous.
 Ligule prominent; blades broad and short..... 67. *P. CURTIFOLIA*.
 Ligule short; blades elongate.
 Blades involute..... 68. *P. JUNCIFOLIA*.
 Blades flat..... 69. *P. AMPLA*.

7900033

TUNDRA

FORM GR-470-18 (Reverse)

10. PANICLE (Cont.):

NUMBER OF PANICLES PER PLANT

MILLIGRAMS SEED PER PANICLE

3

Branches LOWEST WHORL: 1 = DROOPING (Prato) 2 = HORIZONTAL (Merion) 3 = OTHER (Specify) ASCENDING

2

Panicle Habit: 1 = NODDING (Newport) 2 = UPRIGHT (Nugget) 7 5 MM. SPIKELET LENGTH

11. LEMMA

3

KEEL

3

LATERAL NERVES

1 = GLABROUS 2 = SLIGHTLY PUBESCENT 3 = PUBESCENT 4 = OTHER (Specify) _____

1

Intermediate Nerves: 1 = DISTINCT 2 = OBSCURE

2

Basal Webbing: 1 = NONE 2 = SCANT 3 = COPIOUS

12. SEED:

Apomictin Percentage: 1 = MORE THAN 95 2 = 85 TO 95 3 = LESS THAN 85

Phenol Reaction: 1 = NONE - LEMMA REMOVED (Merion) 2 = BEIGE (Cougar) 3 = BROWN (Windsor)
4 = BLACK (Delta - 2 hours) 5 = BLACK (Anheuser - 24 hours)

0 6 0

MM. WIDTH

1 8 0

MM. LENGTH

3 4 0

GRAMS PER 10,000 SEEDS

CHROMOSOME NO. (2n)

13. TURF DENSITY MAINTENANCE AT ONE INCH CUT:

1 = POOR 2 = MODERATE (Merion) 3 = SUPERIOR (Nugget) 4 = EXCELLENT

14. VERTICAL GROWTH RATE:

1 = SLOW (Nugget) 2 = MEDIUM (Merion) 3 = FAST (Delta) 4 = OTHER (Specify relation to a standard) _____

15. SPRING GREEN UP:

1

1 = EARLY (Windsor) 2 = MEDIUM (Fylking) 3 = LATE (Nugget)

16. FALL DORMANCY: (1 = Not Dormant; 2 = Intermediate; 3 = Dormant)

NORTHERN ($42^{\circ} 30' \pm 30'$ Lat.)

INTERMEDIATE ($40^{\circ} \pm 30'$ Lat.)

SOUTHERN ($37^{\circ} 30' \pm 30'$ Lat.)

17. SEEDLING VIGOR (Growth Rate):

3

Seedling: 1 = SLOW 2 = MEDIUM 3 = FAST

18. ENVIRONMENTAL RESISTANCE: (0 = Not Tested; 1 = Susceptible; 2 = Resistant)

0

COOL TEMPERATURE (Winter color)

2

COLD (Injury)

0

HEAT

2

DROUGHT

0

SHADE

2

POOR FERTILITY

2

ACID SOIL

2

ALKALINITY

0

SALINITY

0

SOIL COMPACTION

1

POOR DRAINAGE

0

AIR POLLUTION

OTHER (Specify) _____

19. DISEASE, INSECTS, AND NEMATODE RESISTANCE: (0 = Not Tested; 1 = Susceptible; 2 = Resistant)

HELMINTHOSPORIUM VAGANS.

H. SOROKINIANUM

H. DICTYOIDES

RHIZOCTONIA SOLANI

1

ERYSIPHE GRAMINIS

USTILAGO STRIIFORMIS

FUSARIUM NIVALE

F. ROSEUM

TYPHULA IOTANA

SCELEROTINIA HOMEOCARPA

PUCCINIA GRAMINIA

P. STRIIFORMIS

PYTHIUM ULTIMATUM

CRAMBUS BONIFATELLUS

OTHER (Specify) _____

REFERENCE

Nickerson's or any recognized color fan may be used to determine plant colors of the described variety.

00006

JAN 27 1977

0071
LL/LZ/1

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and \$250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, 6525 Belcrest Road, Hyattsville, Maryland 20782. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

- 5 Insert the date the applicant determined that he had a new variety based on the definition in Section 41 (a) of the Act and decision is made to increase the seed.
- 13a First, give the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method. Second, give the details of subsequent stages of selection and multiplication. Third, indicate the type and frequency of variants during reproduction and multiplication and state how these variants may be identified. Fourth, provide evidence on stability.
- 13b First, give any special characteristics of the seed and of the plant as it passes through the seedling stage, flowering stage and the fruiting stage. Second, describe the mature plant and compare it with a similar commercial variety grown under the same conditions, and indicate the differences.
- 13c A supplemental form will be furnished by the PVPO to describe in detail a variety for each kind of seed.
- 13d Provide complete data indicative of novelty. Seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty may be submitted. Seeds submitted may be sterile.
- 13e Indicate whether applicant is the actual breeder, the employer of the breeder, the owner through purchase or inheritance, etc.